Claims

What is claimed is:

1. A method of radially expanding and plastically deforming a first tube, a second tube, and a mechanical connection for coupling the first and second tubes, comprising:

coupling an insert to at least one of the first and second tubes;

coupling the first and second tubes together using the mechanical connection;

radially expanding and plastically deforming the coupled first and second tubes; and

forming a metallurgical bond between the insert and at least one of the first and second tubes by injecting energy into the insert prior to radially expanding and plastically deforming the first and second tubes.

2. The method of claim 1, wherein the injected energy comprises thermal and mechanical energy.

3. The method of claim 1, wherein the injected energy comprises thermal and electrical energy.

4. The method of claim 1, wherein the injected energy comprises thermal and magnetic energy.

5. The method of claim 1, wherein the injected energy comprises thermal and electromagnetic energy.

6. The method of claim 1, wherein the injected energy comprises thermal and acoustic energy.

7. The method of claim 1, wherein the injected energy comprises thermal and vibrational energy.

8. A tubular assembly, comprising:

a first tube;

a second tube;

a mechanical connection for coupling the first and second tubes; and

a metallurgical connection for coupling the first and second tubes;

wherein the metallurgical connection is provided proximate the mechanical connection; and

wherein the metallurgical connection is a cold welded connection.

9. An assembly, comprising:

a preexisting structure; and

a tubular assembly coupled to and positioned within the preexisting structure, comprising:

a first tube;

a second tube;

a mechanical connection for coupling the first and second tubes; and

a metallurgical connection for coupling the first and second tubes;

wherein the metallurgical connection is provided proximate the mechanical connection; and

wherein the metallurgical connection is a cold welded connection.

10. A cold-weldable insert for forming a metallurgical bond between overlapping threaded ends of adjacent tubular members, comprising:

a tapered tubular member comprising one or more threaded portions for engaging the threaded ends of the adjacent tubular members;

wherein the tapered tubular member is fabricated from one or more materials capable of forming a metallurgical bond with at least one of the adjacent tubular members when energy is input into the tapered tubular member.

11. The insert of claim 10, wherein the injected energy comprises thermal energy.

12. The insert of claim 10, wherein the injected energy comprises mechanical energy.

13. The insert of claim 10, wherein the injected energy comprises electrical energy.

14. The insert of claim 10, wherein the injected energy comprises magnetic energy.

15. The insert of claim 10, wherein the injected energy comprises electromagnetic energy.

16. The insert of claim 10, wherein the injected energy comprises acoustic energy.

17. The insert of claim 10, wherein the injected energy comprises vibrational energy.

18. A method of radially expanding and plastically deforming a first tube having first threads, and a second tube having second threads, comprising:

coupling a first insert to the first threads;

coupling the first threads to the second threads to form a threaded connection by placing the first insert within a portion of the first threads;

heating the threaded connection sufficiently to melt at least a portion of the first insert;

allowing the melted portion of the first insert to flow and solidify within the threaded connection;

placing the coupled first and second tubes within a preexisting structure; and

then radially expanding and plastically deforming the coupled first and second tubes;

wherein the first insert comprises an inner core comprised of a first material, and an outer layer comprised of a second material, and wherein the first material has a higher melting point than the second material;

wherein the first insert comprises an outer layer of flux;

wherein the outer layer of the second material comprises an outer layer of flux;

wherein the first material is selected from the group consisting of aluminum, indium, bismuth, cadmium, lead, tin, brass, and bronze;

wherein the second material is selected from the group consisting of aluminum, indium, bismuth, cadmium, lead, tin, brass, and bronze; and

wherein the preexisting structure is selected from the group consisting of a wellbore casing, a pipeline, and a structural support.

19. An expandable tubular liner comprising a first tube having first threads, and a second tube having second threads coupled to the first threads; wherein the first threads are coupled to the second threads by the process of:

coupling a first insert to the first threads;

coupling the first threads to the second threads;

heating the first insert sufficiently to melt at least a portion of the first insert; and

cooling the melted portion of the first insert;

wherein the first insert comprises an inner core comprised of a first material, and an outer layer comprised of a second material, and wherein the first material has a higher melting point than the second material;

wherein the first insert comprises an outer layer of flux;

wherein the outer layer of the second material comprises an outer layer of flux;

wherein the first material is selected from the group consisting of aluminum, indium, bismuth, cadmium, lead, tin, brass, and bronze; and

wherein the second material is selected from the group consisting of aluminum, indium, bismuth, cadmium, lead, tin, brass, and bronze.

20. An apparatus comprising a preexisting structure coupled to a tubular liner, the tubular liner comprising a first tube including first threads, and a second tube including second threads, wherein the tubular liner is coupled to the preexisting structure by the process of:

coupling a first insert to the first threads;

coupling the first threads to the second threads to form a threaded connection by placing the first insert within a portion of the first threads;

heating the threaded connection sufficiently to melt at least a portion of the first insert;

allowing the melted portion of the first insert to flow and solidify within the threaded connection;

placing the coupled first and second tubes within a preexisting structure; and

then radially expanding and plastically deforming the coupled first and second tubes;

wherein the first insert comprises an inner core comprised of a first material, and an outer layer comprised of a second material, and wherein the first material has a higher melting point than the second material;

wherein the first insert comprises an outer layer of flux;

wherein the outer layer of the second material comprises an outer layer of flux;

wherein the first material is selected from the group consisting of aluminum, indium, bismuth, cadmium, lead, tin, brass, and bronze;

wherein the second material is selected from the group consisting of aluminum, indium, bismuth, cadmium, lead, tin, brass, and bronze; and

wherein the preexisting structure is selected from the group consisting of a wellbore casing, a pipeline, and a structural support.